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UFO ENCOUNTER II

Sample Case Selected by the UFO Subcommittee of the AIAA

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The Lakenheath England, Radar-Visual UFO Case, August 13-14, 1956

Introduction

The following story—a second example of the type of observation which forms the core of the UFO issue—has been selected by the UFO Subcommittee of the AIAA for publication not only because of its puzzling content, but also because of the multiplicity of observations. The author, a former member of the "Condon Committee" (University of Colorado UFO study team), discusses the case, but does not offer an explanation. The same was true for the first case, published in the July 1971 A/A, where the principal observers were highly qualified professionals making sightings in their line of duty. Both case studies are intended to give the reader a flavor of the observational residue material which underlies the UFO controversy. We hope he will give it his independent assessment as engineer or scientist.

On a pleasant August evening in 1956, the night-watch supervisor at the Lakenheath, England, Radar Air Traffic Control Center (RATCC), a U.S. Air Force noncommissioned officer, was startled by a telephone call from the Bentwaters GCA (Ground Controlled Approach) radar installation (see map) asking, "Do you have any targets on your scopes traveling at 4000 mph?" Thus began one of the strangest and most disturbing radar-visual UFO episodes on record.

There is a very large, confusing report on the Lakenheath-Bentwaters incident in the U.S. Air Force Project [illegible] (Project Blue Book was the name of the U.S. Air Force UFO investigation). At least three separate times unidentified radar echoes (UREs) were tracked by the GCA unit at Bentwaters before the telephone contact with Lakenheath; and although these are highly interesting events in themselves, they did not involve confirmatory visual and airborne radar contacts. A detailed account of these first three radar contacts can be found in an earlier paper by James McDonald (FSR *16*, "UFOs over Lakenheath in 1956," 1970, pages 9-17). "Scientific Study of Unidentified Flying Objects" (Bantam Books, 1969; hereafter refered to as the "Condon Report") contains no account of these because the pertinent Bluebook files were obtained too late for inclusion. The Condon Report does contain an independent account of the primary incident at Lakenheath, as reported by the night-watch supervisor, *not* found in the Bluebook file; this separate report forms the most coherent account of the events at Lakenheath.

Following a brief description of the events at Bentwaters based on the Bluebook file, the Lakenheath incident will be described here based mainly on the night-watch supervisor's account.

Account of Observations

The four events at Bentwaters GCA (see map for plots of these radar tracks) took this order:

1. At 2130Z a URE (No. 1 in map) was picked up on the Bentwaters AN/MPN-11A GCA radar about 25-30 mi. to the ESE. (Note that Z time—zero meridian time—, or GMT, is also local time in the Lakenheath-Bentwaters area.) This URE moved steadily on a constant [illegible] contact was lost about 15-20 mi. to the WNW of Bentwaters. The radar operator estimated the apparent speed of the URE as 4000 mph; but the transit time of 30 sec yields an estimate of 4800-6000 mph, and the operator's estimate of 5-6 mi. covered by the URE between PPI sweeps (2 sec apart) gives an estimate of 9000-10,800 mph. "The size of the blip when picked up was that of a normal aircraft target. [It] diminished in size and intensity to the vanishing point before crossing the entire radar screen."

2. A "few minutes later," say roughly 2135Z, a group of 12-15 UREs was picked up on the PPI about 8 mi. SW of Bentwaters (No. 2 in map). These echoes "appeared as normal targets," and "normal checks made to determine possible malfunctions of the GCA radar failed to indicate anything was technically wrong." These URE's appeared to move as a group toward the NE at varying speeds reported as 80-125 mph. The group covered a "6-7-mi. area" on the scope. These echoes "faded considerably" at a point 14 mi. NE of Bentwaters, but were tracked to a point about 40 mi. NE of Bentwaters when they merged into a single strong echo "several times larger than a B-36 return under comparable conditions." This single echo remained stationary at the point 40 mi. NE of Bentwaters for 10-15 min., then moved to the NE for 5-6 mi., stopped again for 3-5 min., and finally moved out of range (50 mi.) of the radar at 2155Z. The average apparent speed of the URE group for the time it was in motion can be readily calculated as between 290 and 700 mph (58 mi. in 5-12 min—again differing from

about 600 mph with no acceleration or deceleration apparent—the changes varying in indicated length from 8 to 20 mi., with stationary episodes of 3-6 min intervening.

There were visual sightings at Lakenheath during this time, but the reports of these are confusing and inconclusive. Perhaps of greater significance are the investigating officer's statements that "two radar sets [Lakenheath GCA and RATCC] and three ground observers report substantially the same," and "the fact that radar and ground visual observations were made on its rapid acceleration and abrupt stops certainly lend [credence] to the report."

After "about 30-45 min," or 2340 to 2355Z, the RAF "scrambled" a de Havilland "Venom" night fighter aircraft to investigate the Lakenheath UFO.

(At this point, the account of the Lakenheath night-watch supervisor and that of the Bluebook report diverge. First, the watch supervisor says the aircraft was from a field near London and was picked up on the RATCC radar inbound from the southwest at a range of 30-45 mi. from Lakenheath. According to the Bluebook file, the fighter took off from Waterbeach RAF station (see map), which is only 20 mi. SW of Lakenheath and well within radar range—given as 50-60 mi. for targets at 5000 ft or above. Second, the watch supervisor relates that the Venom was vectored to the then stationary URE (No. 5) at a position about 16 mi. SW of Lakenheath, and that this was the aircraft's first and only contact with any UFO. According to the Bluebook account, "the a/c flew over Lakenheath and was vectored to a radar target 6 mi. east of the field (No. 6). Pilot advised he had a bright white light in sight and would investigate. At 13 mi. west [of Lakenheath] he reported loss of target and white light [N.B. —this implies that the pilot had the unknown on his airborne radar as well as having had visual contact]. Lakenheath RATCC vectored him to (presumably) another target 10 mi. east of Lakenheath and pilot advised target was on radar and he was "locking on." This target would be URE No. 5, identified by the watch supervisor as being about 16 mi. SW of Lakenheath. Except for this discrepancy, the account of the Lakenheath watch supervisor agrees with the Bluebook file from here on in virtually every detail.)

The Venom fighter was vectored by the RATCC radar to the sight of the URE, which (according to the night-watch supervisor) was stationary at the time at 15,000-20,000 ft about 16 mi. SW of Lakenheath. Shortly after Lakenheath told the pilot the URE was one-half mile dead ahead of the interceptor, the pilot radioed, "Roger, . . . I've got my guns locked on him." (The pilot refers to a radar fire-control system.) This pilot later told a U.S. Air Force investigator that the URE was "the clearest target I have ever seen on radar." There was a brief pause after the Venom pilot said he had gunlock on the URE and then he said, "Where did he go? Do you still have him?" The Lakenheath RATCC informed him that the URE had made a swift circling movement and had gotten behind the Venom. The pilot then confirmed that the target was behind him and said that he would try to shake it. Since no tail radar is mentioned, the pilot presumably saw the UFO behind him.

The pilot of the Venom interceptor tried numerous evasive maneuvers, but he was unable to lose the URE, which the Lakenheath RATCC radar continuously tracked as a distinct echo behind the aircraft echo; this implies that the separation was greater than about 500 ft. According to the Bluebook report, "Pilot advised he was unable to 'shake' the target off his tail and requested assistance." After about 10 min., the first Venom pilot, who reportedly sounded "pretty scared," said that he was returning to base because he was running low on fuel. He asked Lakenheath RATCC to tell him if the URE followed him on the radar scopes. According to the Lakenheath watch supervisor, the URE appeared to follow the Venom only a "short distance" as the pilot headed SSW toward London [or Waterbeach], and then it resumed a stationary aspect.

A second Venom was vectored by Lakenheath RATCC toward the position of the URE; but before he got close enough to pick up anything, he radioed that he was experiencing engine malfunction and was returning to his base. The following conversation was monitored by the Lakenheath watch supervisor between the two Venom pilots:

Number 2: "Did you see anything?"

Number 1: "I saw something, but I'll be damned if I know what it was."

Number 2: "What happened?"

Number 1: "He—or it—got behind me and I did everything I could

BENTWATERS-LAKENHEATH URE/UFO CONTACTS
August 13-14, 1956.

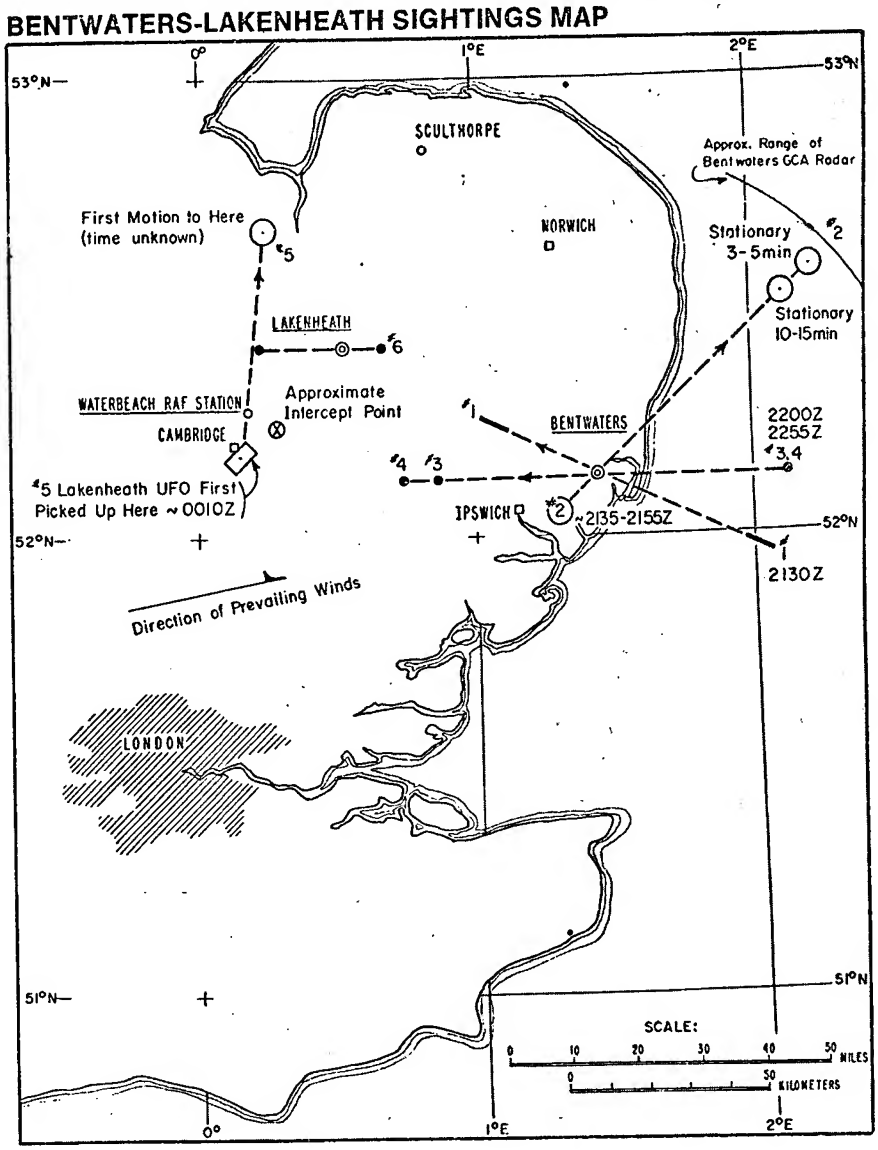
No.	Time	Radar contacts	Visual contacts	Remarks
1	2130 Z	Bentwaters GCA, AN/MPN-11A.	Not confirmed.	Not AP.
2	~2135—2155 Z	Bentwaters GCA.	Not confirmed.	Possible AP.
3	2200 Z	Bentwaters GCA.	Not confirmed.	Not AP; possibly same as No. 4.
4	2255 Z	1. Bentwaters GCA.	2. Bentwaters control tower. 3. C47 a/c at 4000 ft over Bentwaters. Apparently same time as radar contact.	Not AP; No. 5 could have been same "object."
5	0010—0330 Z	1. Lakenheath RATCC, CPS-5. 2. Lakenheath GCA, CPN-4. 3. Venom airborne, A-1. All coincidental at various times (airborne contact when a/c was on scene).	Ground observations not confirmed. 4. Pilot of Venom made visual contact coincidental with the three radar contacts.	Not AP or radar malfunction; may have been No. 4 from Bentwaters.

3. At 2200Z another URE (No. 3 in map) was picked up about 30 mi. east of Bentwaters and tracked to a point about 25 mi. west of the station; the tracking period was about 16 sec. The radar operator estimated the apparent speed of this URE to be "in excess of 4000 mph" but the time and distance figures indicated a speed of roughly 12,000 mph. All the returns "appeared normal, except for the last, which was slightly weaker than the rest." The radar operator indicated that the "[return] disappeared . . . by rapidly moving out of the GCA radiation pattern." No further UREs are mentioned in the Bluebook report on the Bentwaters incident; and considering the confusion prevailing in reported times in Bluebook reports and the similarity of the reported tracks and speeds, possibly this URE and No. 4, which instigated the phone call to Lakenheath, may in fact be the same.

4. According to the Bluebook report on the Lakenheath incident, the Bentwaters GCA radar, at 2255Z, picked up a URE 30 mi. east (of Bentwaters) moving to the west at an apparent speed of "2000 to 4000 mph." In the map shown at right, the track of the URE appears identical with No. 3 except for the vanishing point. This URE then "disappeared on scope 2 mi. east of station and immediately appeared on scope 3 mi. west of station . . . it disappeared 30 mi. west of station on scope." If the word "immediately" means that the URE was picked up on the same PPI sweep, after 180 deg. rotation from east to west, it would imply that the apparent motion covered 5 mi. in 1 sec, an inferred speed of some 18,000 mph. At this rate the URE would have covered the 60 mi. track in about 12 sec (6 PPI sweeps). As pointed out, this may have been URE No. 3 from the Bentwaters Bluebook report, which is estimated at 12,000 mph, although the reported times are different.

At this point, someone at the Bentwaters GCA station called the Lakenheath RATCC station asking the night-watch supervisor there if he had any "4000-mph targets" on his scopes and describing the track of URE No. 4. The caller stated that the control tower at Bentwaters had reported seeing "a bright light passing over the field from east to west at terrific speed at about 4000-ft altitude," while at the same time the

BENTWATERS-LAKENHEATH SIGHTINGS MAP



pilot of a C-47 aircraft flying over the station at 4000-ft altitude reported a "bright light streaked under his aircraft traveling east to west at terrific speed." The Lakenheath watch supervisor, although admittedly skeptical of this report, "immediately had all controllers start scanning the radar scopes . . . using full MTI (moving target indicator), which eliminated entirely all ground returns."

Shortly after this search began, one of the controllers noticed a stationary echo on the scopes at an indicated position 20-25 mi. SW of Lakenheath (No. 5 in map). Note the position of this initial contact on the map; it is almost directly in line with the path of UREs 3 and 4 from the Bentwaters report. Although the MTI should have eliminated the [illegible] any target moving

less than 40-50 knots, the radar personnel could detect "no movement at all" from this URE. The watch supervisor called the GCA unit at Lakenheath to see if they had the same echo on their scope and "they confirmed the target was on their scope in the same location." As the Lakenheath RATCC personnel watched this URE, it suddenly began moving in a NNE direction at a speed that they subsequently calculated to be 400-600 mph. In their words "there was no . . . build-up to this speed—it was constant from the second it started to move until it stopped."

The watch supervisor contacted local AFB command personnel and kept them informed of the happenings from this point on. The URE made several changes in direction [illegible] always at

to get behind him and I couldn't. It's the damnedest thing I've ever seen."

The pilot of Venom Number 1 also stated that he had radar gun-lock for several seconds so "there was something there that was solid."

Following this strange "chase," the URE did not immediately disappear from the Lakenheath RATCC radar. In the words of the night-watch supervisor, "The target made a couple more short moves, then left our radar coverage in a northerly direction—speed still about 600 mph. We lost target outbound to the north at about 50-60 mi., which is normal if aircraft or target is at an altitude below 5000 ft (because of the radiation lobe of that type radar [a CPS-5])." The time of loss of contact was not given by the watch supervisor; according to the Blue-book file the time was about 0330Z.

The night-watch supervisor also stated "all speeds in this report were calculated speeds based on time and distance covered on radar. This speed was calculated many times that evening. . . ."

Discussions

The interpretations and analyses that have been made of this intriguing UFO incident are almost as numerous as the investigators themselves. The investigating U.S. Air Force officer wrote: "My analysis of the sightings is that they were real and not figments of the imagination. The fact that three radar sets picked up the targets simultaneously is certainly conclusive that a target or object was in the air. The maneuvers of the object were extraordinary; however, the fact that radar and ground visual observations were made on its rapid acceleration and abrupt stops certainly lend [credence] to the report. It is not believed these sightings were of any meteorological or astronomical origin." We quote this statement, although these are hardly the words of a careful, scientific investigator.

J. Allen Hynek, the well-known UFO consultant to the Air Force, wrote in part: "It seems highly unlikely, for instance, that the Perseid meteors could have been the cause of the sightings, especially in view of the statement of observers that shooting stars were exceptionally numerous that evening, thus implying that they were able to distinguish the two phenomena. Further, if any credence can be given to the maneuvers of the objects as sighted visually and by radar, the meteor hypothesis must be ruled out."

The Condon Report in its analysis of this incident states: "In conclusion, although conventional or natural explanations certainly cannot be ruled out, the probability of such seems low in this case and the probability that at least one genuine UFO was involved appears to be fairly high." The meaning of this last statement (by the present author) has puzzled some later investigators; in this context a "genuine UFO" was meant to imply precisely that; there was a material object, it was flying (in the sense of moving through the air), and it was (obviously) unidentified. Hence, the conclusion that there was a "genuine UFO" was not meant to imply, for example, that the UFO was necessarily of extraterrestrial origin.

In Chapter 5 of the Condon Report, "Optical and Radar Analyses of Field Cases," the analysis of this report concludes with: "In summary, this is the most puzzling and unusual case in the radar-visual files. The apparently rational, intelligent behavior of the UFO suggests a mechanical device of unknown origin as the most probable explanation of this sighting. However, in view of the inevitable fallibility of witnesses, more conventional explanations of this report cannot be entirely ruled out."

Philip Klass (private communication) believes that the Lakenheath RATCC radar was malfunctioning because of a faulty MTI unit; he feels that once the radar evidence has been explained, the rest can be accounted for by either confusion of witnesses or conventional causes.

The reader may draw his own conclusions as to which of the above "explanations" seems the most likely. However, a few things are worth pointing out in summary:

1. The possibility that meteors might have accounted for these events seems to be easily ruled out, and it was so discounted by early investigators.

2. Visual mirage is ruled out by the large angles (i.e., simultaneously seen over a control tower and under an aircraft) at which the UFOs were observed and by the manner and directions of movement.

3. Anomalous propagation of radar seems equally unlikely as an over-all explanation. All but No. 2 were apparently moving either almost opposite to or across the prevailing winds, ruling out ground objects seen by partial reflections from moving elevated inversions (or other layered structures). Such reflections produce false targets that appear to be at twice the range and twice the height of the reflecting layer, and appear to move in the direction of the prevailing wind but at an apparent speed twice as great. Thus the group of echoes (No. 2) observed from 2135 to 2155Z moved generally from the SW (exact azimuth not given) at "80-125 mph," commensurate with winds of 40-63 mph from the same direction. The actual winds are given as 260 deg/45 mph at 10,000 ft and 260 deg/63 mph at 16,000 ft. Although the reported stationary episodes of the merged echoes at the two points shown on the map would, taken at face value, rule out the moving-layer reflection hypothesis, there remains a possibility that this may have been the cause of the No. 2 URE contact at Bentwaters. This hypothesis can be ruled out, however, for the other URE episodes at Bentwaters, and particularly for those at Lakenheath.

The "disappearance" of URE No. 4 as it overflew the Bentwaters GCA station was mentioned in the Condon Report as being "suggestive of AP" [anomalous propagation], and so it is. The elevated-layer partial reflection phenomenon that causes this type of AP involves a reflection coefficient that is typically proportional to the inverse sixth power of the elevation angle of the radar beam (cf. Wait, 1962; Thayer 1970). Thus caused by a moving layer, if such a false target appears to approach the radar site, the signal will drop below the noise level when the beam elevation exceeds some critical angle; the false target will often reappear on the other side of the radar when the beam angle once more drops below the critical value. With a fixed-elevation PPI display radar, this results in a "zone of invisibility" around the site with a radius on the order of 5-15 mi. in which the target disappears.

Two additional factors seem to point to AP as a possible cause for URE No. 4:

1. Radar operators who are familiar with their sets will not normally report the "disappearance" of a target unless they do not expect it,

which would preclude targets that enter the radar's normal "blind zone" (if it has one).

2. The target was "lost" at 2 mi east but reacquired at 3 mi. west, an asymmetry that is possible with AP but not usual with radar "blind zones."

However, a strong factor argues against the AP hypothesis in this instance: the URE was moving almost opposite to the prevailing winds. In addition, because of the apparent speed of the URE, it should have reappeared about 3.5 mi. west of the radar on the second PPI sweep after "losing" it 2 mi. east (on the first sweep it should have been almost over the radar, and probably not visible to it), so that the "asymmetry" can be assigned to the "digital" sampling by the PPI sweep-scan display. It is therefore most *unlikely* that URE No. 4 was caused by AP, a conclusion also reached in the Condon Report.

The Lakenheath episode (URE No. 5) is even more unlikely to have been caused by AP. That the complicated, stop-and-go maneuvers described by the Lakenheath night-watch supervisor could have been caused by AP returns, and at that on two different radars operating on different frequencies and scan rates, is almost inconceivable. Ghost echoes have often been observed that will appear to "tail" an aircraft echo —sometimes the radar will even track a jet-exhaust plume—but such echoes never stop following the aircraft and become stationary, as did the Lakenheath URE.

In summary, although AP may possibly have been a factor in the No. 2 Bentwaters sighting, it is not possible to assign the rest of the events reported to propagation effects, even aside from the visual confirmations.

Possible malfunction of radar equipment, and especially possible malfunction of the MTI on the Lakenheath RATCC radar, has been suggested as a cause of these UREs. It is true that a malfunctioning MTI unit could conceivably produce false echo behavior similar to that observed at Lakenheath. However, the coincident observation of the URE by the Lakenheath GCA radar, a different type, and later by the Venom's airborne radar, seems to rule out this hypothesis. The detection of an apparently stationary target while the radar was on MTI is not as surprising as it seems. A vibrating or rapidly rotating target will show up on MTI radar even if it is not otherwise in motion.

Thus, none of the conceivable "simple" explanations for the events at Bentwaters and Lakenheath seems to hold up under investigation. Moreover, the credibility of the accounts is increased by the number of redundant radar and visual contacts made coincidentally. The table on page 62 summarizes these redundancies, which are seen to be present primarily for events No. 4 and 5 (Bentwaters URE-UFO No. 4 and the Lakenheath UFO).

One slightly disturbing aspect of these contacts is that the Lakenheath RATCC radar operators failed to "pick up" Bentwaters UREs 1 through 4, even though they should have been well within range. (A target at 5000 ft, for example, should have been visible anywhere west of the coastline in the vicinity of Bentwaters). Note that URE No. 1 was headed almost directly at Lakenheath at the time it was lost by Bentwaters GCA. Of course, it is possible that the radar did pick up these objects and that, for various possible reasons, the operators did not notice or report them.

Conclusions

In conclusion, with two highly redundant contacts—the first with ground radar, combined with both ground and airborne visual observers, and the second with airborne radar, an airborne visual observer, and two different ground radars—the Bentwaters-Lakenheath UFO incident represents one of the most significant radar-visual UFO cases. Taking into consideration the high credibility of information and the cohesiveness and continuity of accounts, combined with a high degree of "strangeness," it is also certainly one of the most disturbing UFO incidents known today.

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